

SKILLS FOR SMART SPECIALISATION IN MOLDOVA

Understanding and managing skills
as a key resource for growth and competitiveness

Summary note

OVERVIEW AND CONTEXT

This report presents findings from an assessment of the implication of skills in the Republic of Moldova¹'s smart specialisation strategy. The European Training Foundation's (ETF) role is to support Moldova as it endeavours to give vocational education and training (VET) systems a clear role in the implementation of its smart specialisation strategy.

Smart specialisation is an innovative policy approach that aims to boost jobs and growth by enabling countries and regions to better exploit their competitive advantage. It is a place-based, bottom-up method that encourages inclusive dialogue among all relevant stakeholders including local authorities, academia, businesses and civil society. It is recognised as a tactic to increase evidence-based public investment that fosters growth and competitiveness at the regional level and improves citizens' well-being. For example, the European Commission's Multiannual Financial Framework 2021–2027 proposes to modernise its Cohesion Policy and create a component of Interregional Innovative Investments to further strengthen interregional and cross-border cooperation. The objective is to support regions with matching smart specialisation priorities to build pan-European clusters based on complementarities and synergies in key sectors such as big data, the circular economy, advanced manufacturing or cybersecurity. Smart specialisation's success has prompted the European Commission to share the benefits of the approach beyond EU borders, where, despite different framework conditions, it is perceived as having the potential to promote decentralised, innovation-led economic transformation as well as foster interregional and cross-border partnerships.

Human capital is a key component of innovation ecosystems (on a par with science, research and technology). Yet VET, along with skills development in general, is not yet central to smart specialisation strategies. To redress this imbalance and connect VET to the broader drive for innovation, growth and competitiveness, in 2019 the ETF developed and began testing a practical guide to analyse the implication of skills in smart specialisation strategies. Based on the lessons learnt from the two pilot studies on Montenegro and Moldova, in 2020 the ETF strengthened and added to the methodology with a view to adapting it to regional contexts. A fully-fledged methodological approach is due to be completed in 2021 and will take into consideration results from regional-based research carried out in Ukraine.

MOLDOVA AND THE EUROPEAN UNION

Moldova collaborates with the EU to implement strategies and create institutions that will revitalise its current industries and, through innovation, discover new ways of growing those industries. In order to foster public policy that supports research and development, the National Agency for Research and Development (NARD) was established in 2018. NARD implements and finances research, innovation and the development of national policy under the EU Framework Programme for Research and Innovation: Horizon 2020.

¹ Hereinafter 'Moldova'.

The European Neighbourhood Policy and the Eastern Partnership further strengthen Moldova's relationship with the EU that has emphasised the importance of VET in Europe's overall plan for growth and jobs with the 2002 Copenhagen Process on enhanced European cooperation in VET and the 2015 Riga Conclusions on how to develop high-quality skills for the labour market through VET. Moldova draws on these policy instruments and resources to incorporate VET, skills and innovation in its economic growth agenda. The strategy is defined by the country's principle economic policy document – National Development Strategy: Moldova 2030. In 2018, the document identified Moldova's priorities as follows:

1. a sustainable and inclusive economy,
2. strong human and social capital,
3. fair and efficient institutions, and
4. a healthy environment.

KEY CHARACTERISTICS OF MOLDOVA'S ECONOMY AND LABOUR MARKET

Moldova's potential for growth is clear, though the World Bank classifies the country as a lower-middle-income. Indeed, it has experienced positive economic growth in recent years. In 2018, its economy grew by 4%. In 2016, it signed the Deep and Comprehensive Free Trade Area with the EU. Since then, Moldovan exports have been moving away from traditional trading partners such as Russia and have been steadily increasing towards the EU. Industrial production increased by 2.7% between January and September 2019. The automotive branch and positive developments in the construction sector contributed to this growth. However, Moldova's traditionally strong food processing sector drives growth in manufacturing, accounting for 37% of production.

In 2018, the number of economically active Moldovans rose to 1.2 million people, an increase of 2.5% compared to 2017. The activity rate for the population aged 15 years or older was 43.3%; more men were active than women. The employment rate was 42%, up from 40.5% in 2017. In 2018, the distribution of the employed people showed that the services sector employs 47.4% of the population, agriculture employs 36.1%, while industry and construction employ 16.5%. Unemployment decreased, primarily affecting men and people living in urban areas. The unemployment rate was at 3.0% for those aged 15 or older, 7.4% for 15- to 24-year-olds and 5.6% for 15- to 29-year-olds. Young people not in education, employment or training (NEETs) accounted for 27.1% of 15- to 29-year-olds. Innovation in VET can raise these numbers and galvanise young workers as well as the workforce as a whole.

The Joint Research Centre's (JRC) mapping of economic and innovation potential in Moldova took place in 2018. It focused on five regions: the municipality of Chişinău, the North, the Centre, the South and the autonomous territorial unit of Găgăuzia. In order to map Moldova's economic potential through smart specialisation, three main aspects were considered: economics, innovation and scientific potential. The mapping identified preliminary priority areas that served as the ETF's entry point to test its approach to analysing human capital as a key resource for growth and competitiveness. The methodology used is summarised in the next section.

RESEARCH METHODOLOGY

To assess the Moldovan economy's skills needs and identify the role of VET, the ETF relied on its own tools and methodologies: for example, labour market analysis, skills mismatch analyses, skill-needs anticipation, Small Business Act (SBA)² and holistic analyses of VET systems, such as the ETF's Torino Process³. The ETF also used labour force surveys as well as other data sources, both quantitative and qualitative, as well as a close engagement of the country's stakeholders at central and sectoral levels. The methodology comprised:

- a quantitative assessment of the skills dimension (supply and demand) in terms of qualifications (measured through the education level obtained), occupations and skills, taking into account demography, such as sex, age and region;
- qualitative questionnaires and explorative, in-depth, semi-structured interviews with employers, employees and other key stakeholders such as incubators, the Chamber of Commerce and Industry, central and local public administration;
- a review of training content currently in place for initial vocational education and training (IVET), continuing vocational education and training (CVET), micro, small and medium enterprise training and other programmes that lead to skill acquisition;
- the identification of current and emerging skills trends and eventual gaps; and
- an analysis of training providers' ability to match emerging requirements and develop recommendations to improve training content.

IDENTIFICATION OF PRIORITY AREAS AND SKILLS REQUIREMENTS

For this study, the Ministry of Education, Culture and Research selected two preliminary priority areas out of eight:

- energy,
- agriculture and food processing.

However, since the areas selected are broad, the research team decided to narrow their focus in the energy sector to renewable energy – and specifically biomass. The ministry requested that the second priority area, agriculture and food processing, focus primarily on food processing.

Several limitations to the research process involving the lack of available data are worth noting. The purpose of smart specialisation is to identify potential activities for innovation-led growth. Since these activities are likely to be new or non-existent, the requisite data are not available. The second limitation involved results from data collection related to employment and skills. Often the accessibility and reliability of these data at the subsector and local levels were limited. Data that would have allowed for the study of labour flows were also not available. Finally, when the skills analysis was

² For more information on the Small Business Act, see: www.ebesm.eu/sba-principles

³ For more information on the Torino Process, see: www.torinoprocess.eu

carried out, the smart specialisation process had not been completed. Thus, assumptions were made with respect to the innovation niches that the country would decide on and more general conclusions were drawn regarding the education and training provision. In order to make up for the lack of data, the research team relied on qualitative interviews with relevant stakeholders.

The analysis of each priority area focused on the following:

- understanding the priority area by identifying the key drivers of change and interlinkages with other parts of the economy; and
- developing a skills-orientated profile of occupations, jobs and human capital.

SKILLS ANALYSIS FOR PRIORITY AREA 1: ENERGY

Overview of the energy priority area

Moldova relies on imports, primarily from Russia and Ukraine, to meet its energy needs. This dependence on energy imports represents an economic burden. As the economy grows, the demand for energy increases; however, Moldova produces less than 20% of its own energy needs. Its reserves of solid fuels, petroleum and gas are insufficient. Its hydroelectric potential is low. Increasing domestic supply would make the country less vulnerable to fluctuating fuel costs and potential supply disruption. For this reason, the driving force behind Moldova's energy policies is to enhance energy security, reduce CO₂ emissions and promote the sustainable development of its economy.

Overview of the renewable energy priority area

In Moldova, renewable energy consumption has been growing; it reached 27.8% in 2017. Biomass, especially solid biomass, accounts for 98% of this consumption. Over the past decade, biomass heating units that burn straw, pellets, briquettes and firewood have been replacing coal- and gas-fired boilers as well as basic stoves. This emerging energy resource and economic area is tied to Moldova's strong agricultural sector that produces the residue and waste to make biomass. The government recognises the potential of this industry for economic growth and job creation. The sector has also attracted interest from external funding bodies like the European Bank for Reconstruction and Development. However, despite the potential for growth and resources available, the country's capacity to deploy renewable energy is limited.

Overview of SMEs in the energy sector

Globally, small and medium-sized enterprises (SMEs) drive the development and production of energy. Researchers predict that SMEs in the energy sector will continue to grow, especially in the renewable energy sector. Between 2015 and 2018, while the share of large enterprises in the energy sector declined from 23% to 20%, the share of micro enterprises in the energy sector increased from 63% to 70%. This demonstrates growth in the entrepreneurial mindset and flexibility in the sector, which can lead to innovation.

Institutional support for SMEs exists in Moldova. For example, the Moldova Eco Energy Competition supports start-ups with innovative energy projects. To strengthen Moldova's capacity in the biomass area, the EU and the United Nations Development Programme established an organisation to bring

together research and development, and institutional stakeholders in the energy sector to promote innovation and disseminating information about biomass.

Analysis of skills needs

The report identifies the following skill sets needed by the energy priority area:

- **Technical competences** – general understanding of the field, with an emphasis on engineering skills. The specialists are expected to install, maintain, test and monitor the energy generation systems.
- **Language competences** – knowledge of foreign languages, especially English, is crucial. This includes the ability to understand and communicate.
- **Digital competences** – the required skills range from basic ICT literacy and the ability to manage and analyse data to the management of IT systems and operational technology.
- **Generic competences** – this includes analytical and problem-solving skills, critical and innovative thinking, motivation/desire to learn, working with others and resilience.

For the renewable energy sector, the following profiles were identified as the most important if renewables are to be focused on within the smart specialisation strategy:

Tertiary education qualification:

- wind/solar power design engineers,
- wind/solar resource assessment specialists, and
- biomass production managers.

Secondary/post-secondary education qualification:

- wind/solar service mechatronics technicians, and
- electricians, plumbers, roofers and construction workers specialising in solar, wind and bioenergy.

Workers with a vocational background are likely to find work in this field, but the number of workers with a low level of education is less than it is in the overall population, which points to a need for a skilled workforce. Staff turnover is lower than it is for all economic activities. However, skills mismatches exist as evidenced by how the number of redundancies exceeds the number of hires.

The energy sector needs more investment, more state support for innovation and technology transfer and a qualified workforce. Improved cooperation with research institutions, universities, and vocational education would also be helpful so that companies do not need to invest as much on employee training. Attracting highly skilled professionals is also a challenge for companies as their salaries are not competitive. From the existing national labour market and education data, as well as interviews with employers, it can be concluded that the energy sector suffers from both skills shortages and skills gaps.

Education in the field of electricity and energy is mainly provided by universities, colleges, centres of excellence and vocational schools. Moldova's 89 VET providers are practical, technology-focused and provide opportunities for work-based learning. Rooted in local communities, they also have good relationships with SMEs. However, VET providers lack the drive necessary for innovation, growth and competitiveness. This limits their scope to respond to the renewables sector that needs new skill sets

quickly, including entrepreneurship skills. This is also the case in higher education where little progress has been made to promote entrepreneurship. Informal and non-formal learning are not recognised and CVET for electricity and energy is rarely available. Currently, the education offer related to renewable energy is very limited and concentrated mainly at the tertiary level. When it comes to vocational secondary or post-secondary education, the offer is almost non-existent in terms of scope and number of providers. The training for adults is underdeveloped and companies are likely to provide ad hoc training themselves.

SKILLS ANALYSIS FOR PRIORITY AREA 2: AGRICULTURE AND FOOD PROCESSING

Overview of the food processing priority area

The agriculture and food processing sector accounts for 18% of GDP and 50% of total exports. The sector employs more than 30% of the labour force, of which 25% (80 700) are directly employed by agri-enterprises, while the other 75% (242 300) are classified as self-employed. Moldova is largely self-sufficient in terms of food production. The sector also supplies raw materials for other agriculture-dependent sectors. However, to achieve stable growth in agri-food exports, there is a need to diversify exports and increase access to high value markets. Challenges include emigration and an ageing labour force; the lack of product testing units in industrial quantities; and limited exploitation of functional products by the private sector. Moldovan organic products are the exception. Seventy-five thousand tonnes of the country's organic products are exported to the EU's high value markets each year, making Moldova the region's market leader.

Analysis of skills needs

The potential to diversify exports also exists with the Moldova's small private farms. They produce a limited surplus of high value-added crops such as fruits, nuts, grapes, vegetables and potatoes. For the moment, they are mostly sold in open-air agricultural markets. Larger agricultural companies specialise in low value-added crops (such as cereals, oilseeds and sugar beet), and employ a limited labour force due to the high level of mechanised operations. SMEs are important to the food processing as well. To stay competitive, they need skills in the following areas: up-to-date pricing strategies, marketing, labelling, supply chain management, technology and operational innovations, such as packaging and sustainable processing.

Requirements in terms of skills for this sector are lower than in the energy sector. In 2018, 33% of those employed in this sector had a general secondary or a low level of education. Manual labourers are still in demand, especially during the growing season. SMEs identified a need for multi-skilled employees who work in an environment where processing, production and sales are integrated. The mechanisation, automation or computerisation of food processing operations require specific skills to operate, regulate and maintain these technologies. A high level of technical and ICT skills and mechatronic engineering are also necessary. Those at management level often have technical skills but lack economic knowledge and business management skills.

Based on the evidence, the following technical and generic skills and knowledge were identified as key to support growth and innovation in food processing:

- advanced mechanical operations;
- ability to operate and maintain machines;
- extensive knowledge of safety-related issues;
- environment-related issues related to sustainable plant design, waste reduction and water protection;
- computation skills that may range from basic knowledge to operate technology to advanced programming skills to manage data or interface with consumers online;
- communication skills, used in different contexts and with different interlocutors, such as employees, supply chain partners and clients; and
- with increased exports, cultural awareness and language skills are also important.

These skill requirements in food processing can be met through formal education programmes as well as short-term workplace training. The programmes in the field of food processing are mainly provided by universities, colleges, centres of excellence and vocational schools. There are 14 VET programmes offered in the field of food processing. CVET in food processing is underexploited. As with other sectors, it is not provided systematically and systemically. Currently, all VET programmes in the field of food processing have set curricula, which are modular in design. However, the textbooks and other didactic materials are still to be elaborated and are lacking at the moment. In the absence of primary didactic sources, the quality of the teaching process is dependent on the quality and motivation of teachers.

Despite the wide range of education and training providers, there are not enough specialists to meet demand. Inadequate human resources practices, uncompetitive job offers, poor working conditions, low salaries and geographical barriers also contribute to this problem, which is especially relevant for SMEs. Furthermore, aspirations for EU membership have led to a series of market-oriented reforms that provide access to the EU single market and facilitate the export of goods. This has led to demand for new skills such as marketing and management, which are essential to understanding consumer needs, ensuring high-quality products and adapting to the requirements of different markets. The use of new technologies in the processing and preservation of food products is predicted to intensify as well, which will increase the demand for the requisite skills. Education and training for the organic food sector has also become necessary, along with background knowledge on environmental issues.

CONCLUSION

The present analysis sought to explore skills data at sub-sectoral level in the context of an evolving labour market. The objective was to improve competitiveness and foster innovation. Two priority areas were covered: renewable energy development and food processing. The impact of skills in both areas was studied using data from quantitative and qualitative research. From the results, it is possible to claim that smart specialisation in the energy sector requires investment in high-skilled workers, while low- and middle-skilled workers make up the food processing sector. Indeed, generally speaking, investment in human capital development has a long-term impact on citizens' and the economy's well-being.

The results also reveal that despite relevant education and training programmes in the field of food processing and energy, skills imbalances persist. The skills mismatches found can be characterised by skills shortages and skills gaps. Both hamper growth and innovation at the micro- and macro-levels. Neither individual companies nor the broader economy can withstand growth and innovation if the labour force is not equipped with the requisite skills that enable increased productivity and the capacity to adapt to market demand. Skills also have an important role in enabling workers to seize the best available opportunities. The types and levels of skills companies require changes with consumer preferences, increased international trade and technological change. Resolving the skills mismatch will allow Moldova's economy to face the future with confidence.

The research findings can be summarised by the following nine recommendations:

1. Position VET in the skills ecosystems for innovation and regional development

Filling the void for vocational excellence in the renewable energy and food processing sub-sectors would enable VET to better meet the demand for skills of both learners and employers. Centres of excellence could play an important role in connecting VET to the broader drive for innovation by both deepening and extending their relationship with employers, in particular SMEs, and by cooperating and coordinating with other skills providers (schools, companies, universities, research organisations and specialist development agencies). In addition, collaboration with stakeholders (e.g. economic development agencies, local authorities, the National Employment Agency, regional employment services, incubators, key companies in the field, social partners and economic sector representatives) responsible for economic development, innovation and competitiveness policies is needed. This would push VET institutions to go beyond the provision of VET qualifications.

2. Overcome skills shortages and skills gaps in renewable energy – with focus on biomass

Building on the pilot educational module on 'Energy and Biomass Project 2', in 2015–17, a vocational training structure on biomass energy and relevant technical specialisation programmes in VET could be developed. Raising young professionals' and students' awareness of career paths in renewable energy, and bioenergy in particular, could help curb skills shortages. In addition, because of the complexity of biomass energy involved with land use, food production, energy, natural resources, and climate change, this topic ought to be embraced by both agricultural education and environmental education programmes. Training programmes should be made available at national, regional and local levels. An important role in applied research skills, the implementation of innovation support services and the facilitation of renewable energy technological transfer could be played by the Centre of Excellence in Energy and Electronics from Chişinău.

3. Overcome skills shortages and skills gaps in food processing

Revisit the existing training offer to address the increased demand for both basic and advanced digital skills, marketing and management skills as well as knowledge on processing and preservation of food products, safety-related and environment-related issues. Address the skills needs of SMEs, an important source of employment in the sector, which require multi-skilled professionals with a broad range of skills, including technical, marketing and communication skills. Strengthening continuing professional education and training is key for up-to-date pricing strategies, marketing, labelling, supply chain management, technology and operational innovations, such as packaging and sustainable processing. Overall, the process of development of occupational standards would benefit from a more active involvement of the industry. In moving forward, cooperation between the Ministry of Education, the Ministry of Economy, ODIMM (the

national SME development agency), representatives of sector associations, and vocational and higher education groups would be required to review occupational standards and improve curricula to ensure relevance of education and training provision.

4. Provide support to SME skills development in renewable energy

Micro enterprises and SMEs are likely to be a major contributor of renewable energy, including biomass energy. Many small companies in the sector are likely to be started by young entrepreneurs. Entrepreneurship education and entrepreneurial learning, such as knowledge, skills and attitudes involved in entrepreneurship, and guidance on entrepreneurship as a career option will play an important role. The recent SBA assessment in Moldova noted important work by the Centre for Entrepreneurial Education and Business Support in vocational education, including development and assessment of entrepreneurship competences. It also noted continued promotion of entrepreneurship skills of pupils in post-secondary vocational education. This could be widened to include more developed entrepreneurial experiences through work placements in renewable energy companies.

5. Provide support to SME skills development in food processing

SMEs would benefit from business development services in food safety, traceability, and packaging to, on the one hand, help reduce the food waste by improving product shelf life, while, on the other hand, move towards more sustainable and circular design of packaging (reduce-reuse-recycle). In terms of digitalisation, SMEs would benefit from support in digitisation of production and sales processes, integrating management procedures based on ICT, big data, and artificial intelligence technologies. In the domestic retail market (retail outlets as well as traditional groceries, food service industries such as restaurants and cafeteria), SMEs would benefit from training on connecting with and meeting retailer demands and requirements. In terms of internationalisation, business development services could be strengthened, e.g. in obtaining internationally recognised quality certificates to gain access to global value chains, accessing the European market, identifying buyers online, and meeting the quality and pricing requirements of European importers.

6. Encourage and enable employer engagement

Strengthening sectoral coordination mechanisms on education business cooperation would help increase employers investment in work-based learning, including apprenticeships and internships. Cooperation could be strengthened, for example, through joint projects with VET institutions, creating partnerships with educational institutions, or getting actively involved in education/labour policy formulation and implementation (e.g. participating in the elaboration of occupational standards, qualification standards and curricula). In particular, focusing on skills needs and development for SMEs is important.

7. Support the role of CVET

VET is mostly supply-driven and focused largely on initial training. Demand for continuing training is growing because of mass emigration among young people, encouraging older workers to continue working and developing their skills. CVET in energy and food processing is scarce, fragmented and uncoordinated. Economic prioritisation will give rise to a need for CVET. A clear strategy is required to develop and increase access to such training, including financial support and stimulus measures.

8. Address limitations in human capital data and statistics

Sound education planning requires reliable data to understand the current situation and anticipate future needs as well as potential skills gaps, which would provide better evidence for human capital management within smart specialisation strategies.

9. Promote replication of similar analyses in other priority areas

Go beyond energy and food processing to develop skills needs analysis for other sectors of the economy.